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ABSTRACT

This study reanalyzed data collected by Heymans and Wiersma in 1908 in response to a questionnaire sent to secondary school teachers in the Netherlands. The 81-item questionnaire asked teachers about the characteristics of the behavior and character of their students (numbering close to 4,000). The reanalysis involved 72 questions that provided data on 1,810 students. The 1908 questionnaire assessed such student characteristics as precision, discrimination, impulsiveness, restlessness, resistance, wantonness, anger, stubbornness, and calmness. First, a factor analysis of the 1908 data revealed that the students' characteristics were grouped into five factors. Second, the traits identified in the 1908 data were categorized according to a system of classifying personality characteristics based on a five factor model (FFM). Finally, the factors identified in the factor analysis were compared to the factors given in the FFM-based classification. Results of this comparison indicated that: (1) the first factor from the factor analysis was a mixture of FFM factors "Openness to Experience" and "Conscientiousness"; (2) the second factor corresponded to FFM factor "Extraversion"; (3) the third factor corresponded to FFM factor "Agreeableness"; (4) the fourth factor was a mixture of FFM factors "Agreeableness" and "Emotional Stability"; and (5) the fifth factor contained mostly elements of FFM factor "Emotional Stability," but also contained elements of FFM factors "Agreeableness" and "Conscientiousness." (BC)

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HEYMANS' ADOLESCENCE INQUIRY AND THE BIG FIVE

data collected in Holland in 1908

and re-analysed in 1992

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1. The adolescence inquiry of 1908, by Heymans and Wiersma of The Netherlands

In 1908 the famous Groningen professor of philosophy Heymans and his collaborator Wiersma sent out a questionnaire with 81 questions "on characteristics of behavior and character" to the directors of 55 schools for secondary education in all the major cities of The Netherlands. These schools went under the names Gymnasium and Hogere Burger-School. Of the latter type many were for girls only. The questionnaire is printed as an appendix to this paper: For close to 4000 pupils (2757 boys and 1103 girls) between 12 and 21 years of age, the questionnaires were filled out by their teachers. Results of earlier analyses performed on these data were published by Heymans and Wiersma (1916).

The questionnaires were kept in the archives of Groningen University. Recently Doddema-Winsemius and De Raad (in preparation) decided to re-analyse these data. Subjects were selected for whom missing data were few and in such a way that a group resulted of 907 boys and 903 girls. Questionnaires for these 1810 subjects were carefully coded anew.

Coding procedure

The original scoring of the items by Heymans and Wiersma varied from item to item, and had therefore to be adapted. The teachers had to underline alternatives when applicable. The alternatives were in italics (see Appendix). Actually, sometimes no alternatives, sometimes one, and sometimes more than one were underlined. The answers to the items were coded two, one, or zero, according to the following guidelines:

a. Items with only one altermative were coded 2 (applicable) or 0 (not applicable).

b. Items with two alternatives were coded 2 (first alternative applicable), 0 (second alternative applicable), and 1 if no alternative was underlined.

c. Items with three alternatives (e.g. item 2, regularly industrious, occasionally industrious, or lazy) were coded 2, for the first, 1 for the second, and 0 for the third alternative.

d. Items that have three or more alternatives that are not graduable (e.g. item 11 behaviour when reprimanded: crying, impudent, arguing, sulking, unconcerned), were split into separate items (a, b, etc.). Each alternative formed one item or, if alternatives were similar in meaning, they were joined to form an item.

Because of the inadequacy of some items, only 73 variables were kept for the re-analysis. In order to investigate the structure of the adolescence variables, PCA followed by varimax rotation was performed on these 72 items. The eigen-values of the first factors are 8.49, 6,56, 3,61, 2,79,

and 2,03, respectively. In Table 1 these first five factors are given. Only those items are represented that load > 0.35 on a factor.

Insert Table 1 about here

Correspondence between these five factors and the Big Five

Together with a team of Georgia University (Kohnstamm & Halverson, in preparation) we are developing a categorization system to accomodate all kinds of temperament and personality characteristics as produced spontaneously in oral or written forms by parents, teachers and children. The system is inspired by the Five-Factor Model (FFM or Big Five) but has also nine categories presumably outside the FFM-domain. The system is set up to categorize personality characteristics of children of school-age. The labels of the main categories are given in the appendix.

Assistants working on this project categorized the 73 items of the Heymans' adolescence inquiry into this category system. They did so without any knowledge of the outcome of the factor-analysis as given in Table 1. In Table 1 the last column gives the results of their classifications. In case two codings are given this reflects hesitation among the coders, partly due to translation problems. The Dutch team coded the original Dutch items and the American team coded the items translated in English.

Discussion

First of all it is remarkable how many of these old questionnaire-items could be categorized in our FFM inspired coding-scheme. Of the 53 items in Table 1 (with loadings ≥.35 on at least one factor) 45 (85 %) were coded by both coding-teams (US and Dutch) in the first five categories of our coding-scheme.
This result is quite similar to what we get when we apply the coding-scheme to all personality descriptors mentioned by parents in free interviews.

Secondly, a structure clearly reminiscent of the FFM, though certainly not identical to it, emerges from the factor-solution presented in Table 1.

The first factor, A, can best be interpreted as a mixture of the FFM factors V (Intellect/Culture) and III (Conscientiousness). Such a blending is quite common when schoolteachers rate their pupils or when pupils rate each other. When Mervielde (1992) let 890 Flemish schoolchildren from third to sixth grade rate each other on twenty five bipolar scales, that were selected to adequately represent the FFM, these schoolchildren produced a first factor that was a mix of V and III.

The second largest factor can best be interpreted as FFM factor I (Extraversion) with touches of III and IV (Emotional Stability).

The third factor can best be interpreted as FFM factor II (Agreeableness).

The fourth factor can be seen as a mixture of FFM factors IV and II.

Finally, the fifth factor binds mostly facets of IV, but includes also facets of II and III.

In studies like this a skeptic will point at the inpure reproduction of the Five Factor Model from these data, collected in 1908. But considering the fact that these data were collected 85 years ago, using a primitive questionnaire (by present-day methodological standards), the fit seems remarkably good, and enhances the confidence in the explanatory power of the Five Factor Model. This notwithstanding the fact that factor III, Conscientiousness, got dispersed over, mainly, the first two factors in these data.

References

De Raad, B., Hendriks, A.A.J., & Hofstee, W.K.B. (1992). Towards a refined structure of Personality traits', European Journal of Personality, 6, 301-319.

Heymans, G. (1910). Die Psychologie der Frauen. Heidelberg: Carl Winter's Universitätsbuch-handlung.

Heymans, G., & Wiersma, E. (1916). Verschiedenheiten der Altersentwicklung bei männlichen und weiblichen Mitschülern. Zeitschrift für angewandte Psychologie, Bd. XI, 441-464. Also in Heymans, G. (1927). Gesammelte kleinere Schriften zur Philosofie und Psychologie, III, p. 548-571. The Hauge: Martinus Nijhoff.

Kohnstamm, G.A., & Halverson, C.F. (1992). The roots of the Big Five; A category system based on the five-factor-model to classify personality characteristics of children. Leiden University and University of Georgia.

Mervielde, I. (1992). The 'Big Five' as a model for teachers' and pupils' personality descriptors and ratings. Paper presented at European Conference of Developmental Psychology, Seville, September 6 - 9.

Wiggins, J.S. (1982). 'Circumplex models of interpersonal behaviour in clinical psychology'. In P.S. Kendall, & J.N. Butcher (Eds.), Handbook of research methods in clinical psychology (pp. 183-221). New York: Wiley.

Table 1.
Loadings on five Factors, and categorization
by judges according to a Big Five inspired coding scheme

	A	B	C	D	E	coding scheme:
29 reminiscent	0.74					V
30 precise	0.70	-0.24				V
31b comprehending	0.70					V
28 discriminative	0.65					III
31a learning by heart	0.55					V
37 clever	0.47					V
27 critical	0.45					IV
32 discerning	0.45	0.36				V
24b prompt	0.44				0.20	XIV
25 precocious	0.38					VII
33 decided	0.36	0.23				III/IV
4 distracted	-0.37		0.30			III
34 slow	-0.52	-0.44			0.25	V/I
42 giving up	-0.59				0.20	III
43 absent-minded	-0.61	-0.22			0.34	III
26 learning without thinking	-0.79					V
67 ostentatious		0.71				I
71 impulsive		0.69				I/III
1 restless		0.68				I
48 bold		0.61			0.20	I
72a cheerful		0.61		-0.25		I/IV
74 laughing		0.47		-0.21		I
72b alternating		0.42		0.34		IV
52 leading		0.36			0.26	I
70 accurate	0.22	-0.39	-0.29	-0.25	-0.25	III
73 pessimistic		-0.49	-0.35		-0.18	I/IV
3 attentive		-0.55	-0.29	-0.30	-0.17	III
49 silent		-0.77				I
7 disturbant			0.71			II
9 rascally			0.69			II
8 goes to extremes			0.64			II
10 resistant			0.61	0.26		II
53 wanton			0.57			II
13 interfering		0.23	0.41	0.22		I
18 tale-bearing			0.40			II
11b impudent			0.38	0.28		II
2 industrious		-0.37	-0.38	-0.26	-0.33	III
78 irritable				0.67		IV
14 angry				0.64		IV
17 stubborn			0.20	0.60		IV
16 resentful				0.50		IV
11d sulking				0.47		IV
63 pedantic			0.23	0.39		IV
65 truthful		-0.21	-0.30	-0.39	-0.27	II
77 hearty				-0.49	-0.25	II
66 natural		-0.27	-0.25	-0.42		II/XIV
12 acquiescent		-0.33		-0.42	0.26	I
75 polite			-0.20	-0.51		II
23 calm				-0.19	0.53	IV
11e unconcerned	-0.26				0.42	IV
21 confessing				-0.23	-0.37	II
22 ambitious	0.23				-0.48	III
79 moody					-0.48	IV

Note: Items loading <0.35 on all factors are omitted and loadings <.20 not printed. Total amount of variance explained:32%

Appendix
Categories for coding descriptors from 'free' personality descriptions

FACTOR 1: EXTRAVERSION

CLUSTER 1A: Sociability, outgoing vs. shy

1A +	1A -
enthusiastic	tendency to shut self off
totally thrilled to be alive	sullen and withdrawn
effervescent	shy, bashful

CLUSTER 1B: Dominance, Leadership, Assertiveness

1B + HIGH	1B -
a leader	passive
strong character	follows everyone
assertive	doesn't stand up for self

CLUSTER 1C: Activity, Pace, Tempo, Energy, Restlessness, Vitality

1C +	1C -
active	quiet
energetic	not physically active
always on the move	doesn't do much

FACTOR 2: AGREEABLENESS

CLUSTER 2A: Helpfulness, cooperation, amiability

2A +	2A -
loving	selfish
good natured	impatient
caring	not a good helper

CLUSTER 2B: Manageable for parents and teachers

2B +	2B -
well-behaved	argumentative
never belligerent	stubborn
cooperative	rebellious

CLUSTER 2C: Honest, sincere

2C + HIGH	2C -
sincere	lies
honest	can be deceiving
trustworthy	insincere

FACTOR 3: CONSCIENTIOUSNESS

CLUSTER 3A: Carefulness

3A + HIGH	3A - LOW
long attention span	forgetful
good concentration	daydreamer
responsible	careless

CLUSTER 3B: Faithfulness

3B +	3B -
very loyal to his friends	no examples
stands up for his friends	
reliable	

CLUSTER 3C: Diligence, industriousness, persevering

3C +	3C -
determined	needs motivation
hard worker	lazy
competitive	unwilling to work

FACTOR 4: EMOTIONAL STABILITY

CLUSTER 4A: Emotional Reactivity and Stability

4A +	4A -
cries a lot	under control
sensitive to words from others	very resilient
needs to control temper	rarely loses temper

CLUSTER 4B: Self-confidence

4B +	4B -
confident	lacks self-confidence
self-assured	insecure
certain	tentative in his own assessment of his abilities

CLUSTER 4C: Anxious, fearful

4C +	4C -
examples would be: afraid of the dark, afraid of dogs, etc.	doesn't exhibit a lot of fears or nervousness

FACTOR 5: OPENNESS TO EXPERIENCE

CLUSTER 5A: Openness to experience, Adventure-seeking

5A +	5A -
curious	afraid of failure
inquisitive	not too open (to new things or ideas)
easily interested in new things	hesitant to do things

CLUSTER 5C: Intelligence, language proficiency, reasoning capacities

5C +	5C -
bright	difficult in understanding
quick to learn	slow to learn

FACTOR 6: INDEPENDENCE, ABILITY TO DO THINGS INDEPENDENTLY (1.1 %)

6 +	6 -
independent	doesn't do things on his own
often involved in activities on	
likes to do things on his own	too dependent on mom

FACTOR 7: MATURE FOR AGE (1.1 %)

7 +	7 -
mature	babyish behavior
precocious	emotionally immature
intelligent for age	young for his peer group

FACTOR 8: ILLNESS, HANDICAPS AND HEALTH

8 +	8 -
healthy	sickly
	severe allergy problems, attention deficit disorder

FACTOR 9: RHYTHMICITY OF EATING, SLEEPING, ETC.

9 +	9 -
likes things to run on regular schedule	no examples

FACTOR 10: GENDER APPROPRIATE, PHYSICAL ATTRACTIVENESS

10 +	10 -
he's all boy	he only likes to play with girls
attractive, handsome	

FACTOR 11: SCHOOL PERFORMANCE, ATTITUDES TOWARDS SCHOOL

11 +	11 -
eager about school	talks when he is not supposed to in school
excellent student, self-motivated at school	not challenged at school

FACTOR 12: DESIRE TO BE CUDDLED, CLINGING

12 +	12 -
cuddly, huggie, touchy	clinging to mom

FACTOR 13: RELATIONS WITH SIBLINGS AND PARENTS

CLUSTER 13A: Sibling Relationships

13A +	13A -
helps with siblings	ignores sister
watches out for brother, problems with siblings	will not play with brother

CLUSTER 13B: Interaction with parents and family

13B +	13B -
likes to do things with the family	not too eager to do things with family
oriented to her family	
good father-daughter relationship	

FACTOR 14: AMBIGUOUS, PHRASES AND DESCRIPTIONS THAT CANNOT BE CODED IN OTHER CATEGORIES

strong spiritual character
persnickety
too materialistic
big
he can charm people